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A direct technique for magnetic functionalization of living human cells

Dzamukova M., Zamaleeva A., Ishmuchametova D., Osin Y., Kiyasov A., Nurgaliev D., Ilinskaya O., Fakhrullin R.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

Functionalized living cells are regarded as effective tools in directed cell delivery and tissue engineering. Here we report the facile functionalization of viable isolated HeLa cells with superparamagnetic cationic nanoparticles via a single-step biocompatible process. Nanoparticles are localized on the cellular membranes and do not penetrate into the cytoplasm. The magnetically responsive cells are viable and able to colonize and grow on substrates. Magnetically facilitated microorganization of functionalized cells into viable living clusters is demonstrated. We believe that the technique described here may find a number of potential applications in cell-based therapies and in development of whole-cell biosensors. © 2011 American Chemical Society.

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